

Electricity Being Used to Hasten Crops

EXPERIMENTS on a large scale with the use of electricity to stimulate the growing of crops are among the English government's latest efforts to increase the country's home food production. The department of agriculture has taken over a large area near Hereford, where installations have already been set up for the use of ionized agricultural experts under Prof. W. H. Blackman of the Imperial College of Science and Technology who will supervise the experiments.

In the Hereford experiment high tension alternating current is to be used. Spring wheat, barley, oats and clover will be dealt with, and fertilizers of various types will

about \$300, which is not so very high.

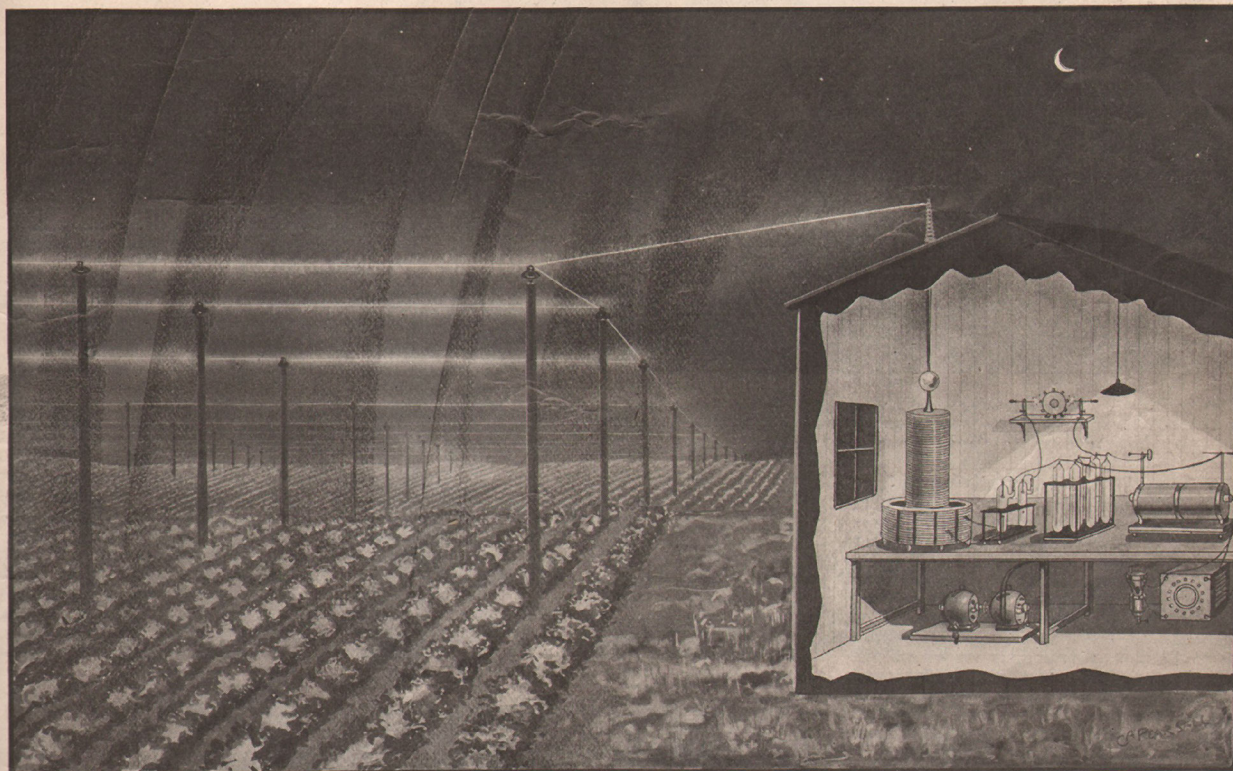
The present method of overhead discharge from wires stretched over the crops was introduced into England twenty years ago by Professor Lemstrom of Helsingfors, whose book, "Electricity in Agriculture and Horticulture," anyone interested in the subject should consult. The method was modified by Mr. J. E. Newman, in conjunction with Sir Oliver Lodge. These and others formed themselves into the Agricultural Electric Discharge Company, which disposed of a large number of installations both in England and abroad.

Very contradictory results were obtained by the various users of the Lodge-Newman apparatus, and the subject lost much pres-

Roberts, near Carnarvon in Wales.

The engineers of the Carnarvon plant are convinced of several important features which have not been previously noted. They are emphatically of opinion that the ionization of atmosphere is but of secondary importance, though attention is being particularly paid to the influence of prevailing winds to widen the area of influence. They maintain the main effect of the discharge is noticeable on the soil, and that soils heavily manured are more effectively benefited by reason of the latent humidity. The active result upon the soil is apparently due to the release and nitrification essential to the well-being of plant life.

The dark green foliage and the building-up



NIGHT-SCENE OF AN ENGLISH HIGH FREQUENCY PLANT GROWER.

In England, More Than In the United States, the Stimulating Effect of a High Tension, High Frequency Discharge on the Growth of Plants, Particularly Vegetables, Is Being Carefully and Extensively Tested Out. Standard High Voltage Electric Generators for This Purpose Are Available on the English Market.

also be used in these experiments.

The method adopted is to stretch over the field to be treated a number of thin wires on poles, something like low telegraph wires, but high enough for loaded wagons to pass underneath. The wires are supported by high tension insulators on posts in long parallel spans thirty feet apart.

"The charge fizzes off from the wires," says one account, "with a sound which is sometimes audible, and with a glow which is visible in the dark. Anyone walking about below the wires can sometimes feel the effect on the hair of the head, as a cobweb on the face. The electricity does not act as a fertilizer but as a substitute for sunlight. The current is only used in the early morning and in cloudy weather." The initial cost of the apparatus for twenty-four acres is about \$1,500, and the annual cost, including depreciation and labor, is

tige. The results of the company's own experiments with wheat in over a series of years were reported as an increase varying from 0 per cent to 39 per cent. The next phase in the development of electro-culture opened in 1911. The British Board of Agriculture gave a grant to Professor Priestley of Leeds for a scientific investigation of these new methods and their value. Professor Priestley collaborated with Mr. I. Jorgensen, an electrical expert and plant physiologist, and with Miss E. C. Dudgeon of Dumfries. In the result it appeared that many technical difficulties existed. At first no favorable results were obtained, but in the last two years, with improved methods, increases of 50 per cent over the ordinary crop have been recorded with oats on Miss Dudgeon's land.

A very complete installation has recently been connected up in the extensive vegetable gardens owned by Sir Thomas E.

of new tissue is evident proof of the greater vigor and increased growth of the plant. Furthermore, confirmation is provided of the fact that sunlight is detrimental to the discharge to be in operation at the same time (more successful working is obtained at sunrise and sunset); a time-switch can be automatically arranged to switch the current on and off at these times.

This fact also emphasizes the approximate degree of humidity necessary for the success of the discharge, as the amount of dew or latent humidity prevalent at these periods are more or less helpful. Whereas, in heavy rain the discharge is inclined to run to waste, owing to insulation troubles. It must be borne in mind that the intensified and rectified voltage of 75,000 volts to 100,000 volts has to be dealt with in a very different manner to the ordinary electric light voltage, and the methods of control

(Continued on page 493)



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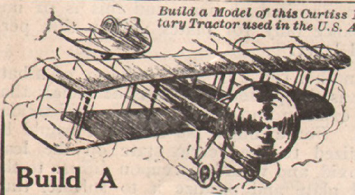
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MISTOOK FAN FOR "SPY" WIRELESS.

A large electric fan on top of the New York Edison Company building at Fifty-third street and Sixth avenue, New York City, was taken for a German wireless apparatus by a passing citizen, and the police department was notified.

The man saw sparks coming from the fan, which is used to ventilate the building, and told the police that Teuton spies were sending messages. It would pay all of us to study up a bit on radio and electrical matters these days.

ELECTRICITY BEING USED TO HASTEN CROPS.

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together with the periods of working are important factors in the welfare of the installation. The current expended at Carnarvon is economical in working. The current required at the primary terminals amounts to 450-460 watts per acre per hour (approximately only half a unit); the reason for the discrepancy is entirely atmospheric, the energy required being greater in proportion to the prevailing humidity to make up for the sundry current loss. This occurs on dull heavy days when mist or heavy dew prevails, whereas on prevailing dry periods the efficiency is uniform.

At Carnarvon the apparatus is fixed permanently in a small shed, and is connected to the main cable which supplies electric light for the residence, the out-buildings and farm. The initial voltage is 220 volts continuous current, and passes thru a controlling switchboard to the intensifying apparatus. The chief feature of the overhead wiring is the careful manner observed in insulating the wires, which are suspended over the respective garden plots—a uniform height of 7 feet has been adopted in order to allow freedom for the garden staff to carry on the work of cultivation when the current is not in use.

Electroculture has past the back-garden, amateur stage. It is now a serious proposition. But knowledge of its possibilities and limitations is scanty. It falls into place with other possibilities of development in plant industry, which will only reach fruition by the help of well-organized, large-scale research and experiment supported by public funds.

CHEMICAL ACTION OF STORAGE BATTERIES.

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If a battery is allowed to stand on open-circuit after charging, the electromotive-force falls in fifteen or twenty minutes to the value corresponding to the density of the acid. This is due to solution around the plates becoming saturated with lead sulfate. On discharge, when the voltage has fallen below the value corresponding to the density of the acid, standing on open circuit brings it back to normal value. In this case the recovery, as it is termed, is due to the diffusion of the sulfuric acid into the pores of the plate where it has become exhausted.

If a charged cell is permitted to stand idle, the density of the acid slowly depreciates, and the quantity of electricity obtainable from it diminishes from day to day. This is known as the *self-discharge* of the battery, and for a cell in good condition amounts to from one to two per cent per day; if impurities are contained in the acid, it sometimes will amount to 50 per



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